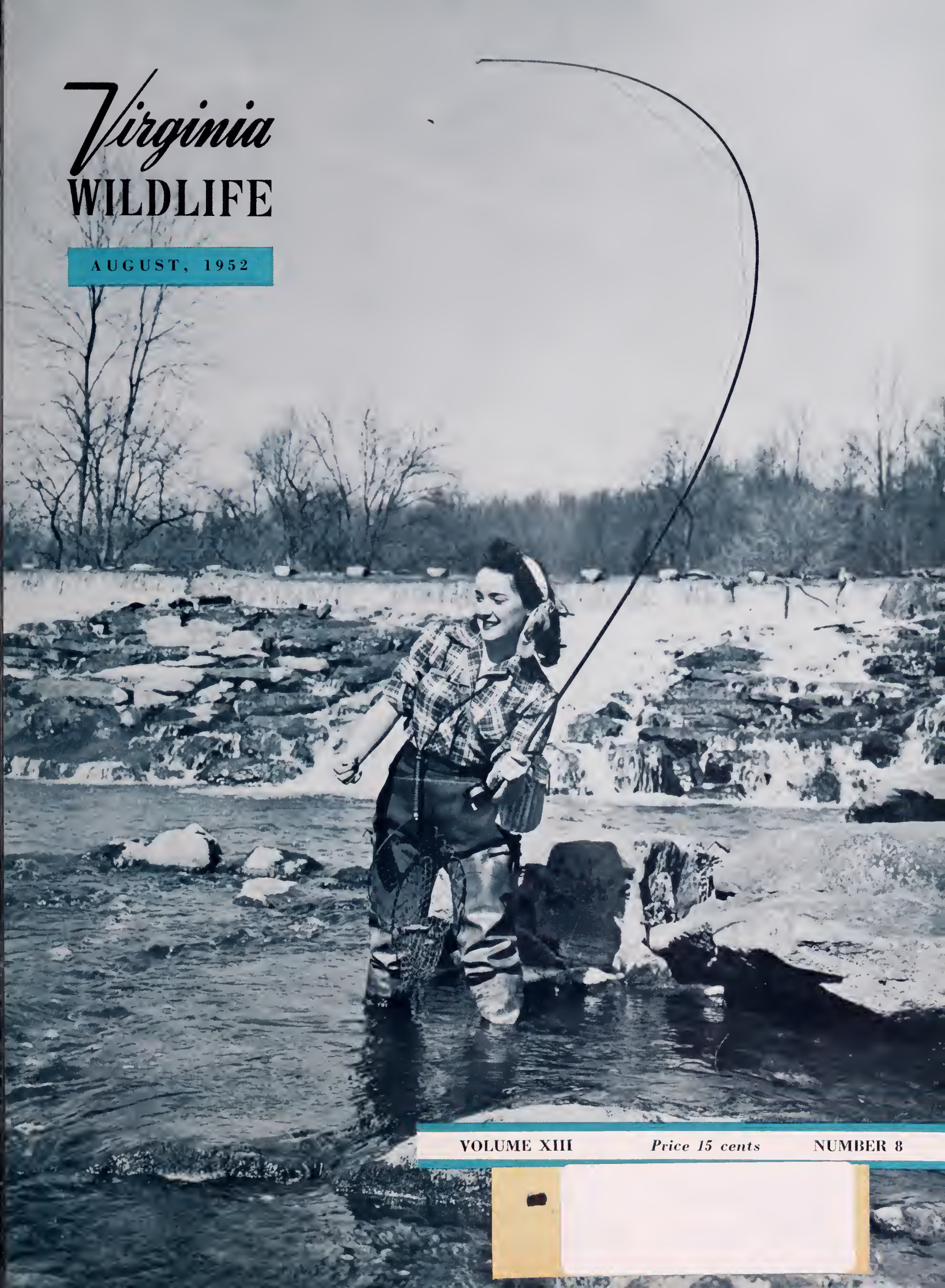


Virginia WILDLIFE

AUGUST, 1952



VOLUME XIII

Price 15 cents

NUMBER 8



Photo courtesy V. S. C. C.

Gateway to the West

*Fabulous New River meanders its majestic way through
Virginia's Giles County, then piles into New River Gorge,
gateway to West Virginia and the Ohio*

Virginia WILDLIFE

Published by VIRGINIA COMMISSION OF GAME AND INLAND FISHERIES, Richmond 13, Virginia

A Monthly Magazine Dedicated to the Conservation, Restoration, and Wise Use of Virginia's Wildlife and Related Natural Resources, and to the Betterment of Hunting and Fishing in Virginia

COMMONWEALTH OF VIRGINIA



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Cover

August is fly rod time, as is so deftly being demonstrated by this young lady after smallmouths.

Photo by Harold M. Lambert Studios

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THE JOB AHEAD

NOT SO LONG ago Dr. Robert M. Salter of North Carolina assumed reins as new chieftain of the U. S. Soil Conservation Service in Washington, replacing that grand and venerable conservationist Dr. Hugh H. Bennett who was boosted to the position of assistant secretary of agriculture.

Dr. Salter delivered a memorable address recently at the sixth annual meeting of the National Association of Soil Conservation Districts. We think that it merits recognition, particularly so in Virginia where a great deal of fine co-operative work is being done between the Game Commission and the Soil Conservation Districts.

We should like to make some quotations from that fine speech of Dr. Salter's, for it is worth reading, worth remembering. Said the new S. C. S. chief:

"The concept of soil conservation has come to mean proper land use, protecting the land against all forms of soil deterioration, rebuilding eroded soil, conserving moisture for crop use, proper agricultural drainage and irrigation where needed, building up soil fertility, and increasing yields and farm income—all at the same time.

"It is based on the understanding that you can conserve soil without building it, but *you cannot build soil without conserving it.*

"Modern conservation farming involves increasing soil productivity and increasing standards of farm living for today, tomorrow, and for posterity. It combines the objective of national welfare with better living for the people who work the land. It has come to mean efficient abundant production on a sustained basis.

"There is ample evidence throughout the country, in every county and every soil conservation district, that our soils can be made to produce more abundantly. Studies now being made, aimed at estimating agriculture's maximum production potentials, indicate that average per-acre yields for most crops could be increased from 60 to 75 percent if all of the technology now available could be put to work on the land.

"Throughout the country farmers and ranchers are working together on Extension committees, on Rural Electrification boards, on PMA committees, on credit boards, on advisory grazing boards, on irrigation district boards, and—last but not least—on soil conservation district governing boards.

"In my judgment, soil conservation districts represent the best device so far created through which Government can assist farmers without dominating them. Soil conservation districts provide one of our best examples of democracy in action.

"To develop a sound plan for conservation farming, a farmer needs, first, to have a *scientific inventory* of his soil and water resources. Few if any farmers can classify their own soils.

"Next, the farmer needs assistance in determining the *best alternative uses and treatment* for the land based on this scientific inventory. He needs help in developing a plan for soil and water management using the best technology adapted to the physical and human resources of the farm and to watershed and other resource problems of the community.

"Finally, most farmers need *technical help in putting complex practices into application.* Few farmers have the necessary training to lay out complicated water-control systems and terraces. Many need technical assistance in range management, in establishing improved pastures, in woodlot management, and other complex practices.

"Furnishing this on-farm technical assistance for soil, water, and plant management—aimed at soil protection and improvement, water conservation, and economic production on a sustained basis—is the primary job that the Congress has assigned to the Soil Conservation Service working with and through soil conservation districts.

"Although there may be misunderstandings, I see no necessary duplication between education, technical assistance, and financial assistance in public-supported effort to help farmers get conservation farming into practice.

"THE JOB AHEAD involves making all three work harmoniously and more effectively as a team in speeding up the application of technology on the land.

"We can stop the decline of our Nation's precious soil resources. We can build new life into our depleted soils. We can reach levels of production far above those of today. We can meet the pressing demands of a growing and vigorous nation on its agriculture. And we can create in America a shining example of what democracy and science, properly joined, have to offer a free world. This is, for us all, THE JOB AHEAD."

National Parks in Virginia

—variety, unlimited

By JAMES W. HOLLAND

Regional Historian, Region One, National Park Service

Photos courtesy the National Park Service

FROM THE BLUE WATERS of the York River to the lofty Blue Ridge Mountain chain are extended Virginia's ample share of the areas of scenic grandeur and historic import administered for the American people by the National Park Service of the United States Department of the Interior. They range in size from Shenandoah National Park with almost 200,000 acres to little Yorktown National Cemetery with less than three. Some, such as the Blue Ridge Parkway, feature spectacular scenery. Others commemorate great moments in our national history: the first permanent English settlement at Jamestown; the surrender of Cornwallis at Yorktown which marked the real beginning of American independence; another surrender 84 years later at Appomattox presaging the birth of a reunited nation.

For convenience in administration and, more particularly, to denote differences in the character of the various units, the National Park Service has grouped the areas in ten classes: national parks, national capital parks, national historical parks, national battlefield parks, national monuments, national military parks, national memorials, national cemeteries, national parkways and national historic sites. Virginia alone, among "The Forty-eight," has within her boundaries at least one example in each of these national park categories.

Shenandoah National Park is one of only five such areas east of the Mississippi River. The others bearing the "National Park" tag are Everglades in Florida, Great Smoky Mountains in North Carolina and Tennessee, Mammoth Cave in Kentucky and Acadia in Maine.

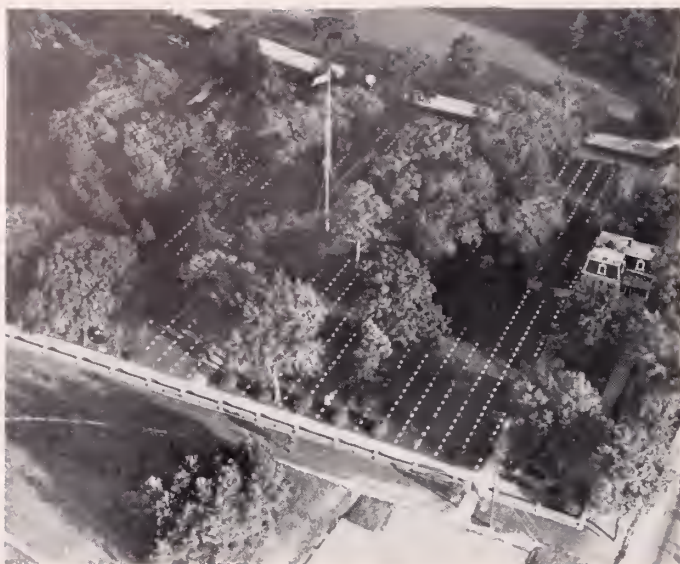
Shenandoah is a scenic wonderland with lofty peaks softened and beautified by heavy forest cover. Through the park, from Front Royal south 75 miles to a point near Waynesboro, courses the famed Drive known to most Virginians as the "Skyline Drive," a name apparently so pleasing that many apply it to the entire park.

Like all units in the National Park System, regardless of their classification, Shenandoah National Park is a wildlife sanctuary. Hunting and trapping are totally prohibited; there is no "open season." There are no exceptions, though "hunting" with cameras is encouraged at all national parks and monuments. In the non-historical areas facilities for hiking, camping, picnicking, fishing (with proper state license and in season), are available.

Picking up at Rockfish Gap, where the Drive through Shenandoah ends, the Blue Ridge Parkway gently winds its way southward through the magnificent scenery of the Southern Highlands. For some 350 miles this high road follows the Blue Ridge Mountains, then turns through the Blacks, the Craggies, the Pisgahs, and the Balsams to the Great Smokies. The lowest point on the Parkway is at the James River crossing, elevation 650. Then in a scant 13 miles it climbs, through rugged and spectacular country, to its highest point in Virginia at Apple Orchard Mountain. In that short distance, the parkway gains 3,300 feet in altitude! After providing a memorable experience in motoring for a distance of some 200 miles from Rockfish Gap, the Parkway leaves Virginia about 10 miles southeast of Galax.

Scenic grandeur and natural features are not all that the





The U. S. National Cemetery at Yorktown, Virginia. It commemorates the War Between the States

National Park Service is charged with preserving in Virginia. There are, too, places of primary historical significance: Jamestown and Yorktown; the battlefields of Fredericksburg, Spotsylvania, Chancellorsville and the Wilderness; the field of First and Second Manassas; the scene of the siege of Petersburg; the desperately defended fortifications around Richmond. George Washington's birthplace in Westmoreland County is commemorated as a National Monument; Robert E. Lee's mansion at Arlington is preserved as a National Memorial.

Jamestown Island, sometimes known as the "Birthplace of the Nation," has such basic and intimate connection with the establishment of the colony and with the development of representative government that it would be needless to particularize. The Island, with exception of Jamestown National Historic Site, is included in the National Park System. The Site which has, among other important features, the old church tower, is owned and operated by



The old church tower, Jamestown. The only standing ruin which dates back to the seventeenth century

the Association for the Preservation of Virginia Antiquities, a distinguished society, now in its 63rd year, which is internationally recognized for sterling contributions in the salvage and preservation of Virginia's historic treasures.

Colonial National Historical Park at Yorktown, which includes also the Federal lands at Jamestown, recalls the scene of surrender of the British Army under Lord Cornwallis to the combined French and American forces under General George Washington, October 19, 1781. The colonial village of Yorktown, the Moore House (restored) where the terms of surrender were drawn up, the Swan Tavern group (reconstructed) and the inspiring Yorktown Victory Monument are among features of this Park. The Information Center, in the Swan Tavern at the corner of Main and Ballard Streets, is open daily and features exhibits on Yorktown and the stirring events which took place there in the last days of the American Revolution. The Moore House is open to the public from March to



The victory monument, on the Yorktown battlefield, makes up a part of Colonial National Historical Park

December; there is a small admission fee for all except children and educational groups.

As would be expected, the Commonwealth of Virginia, as the seat of government of the Confederacy, was the scene of some of the bitterest and most dogged fighting in the devastating War of 1861-1865. At Manassas National Battlefield Park is preserved the scene of the opening field battle of that war, July 21, 1861, and site of another Confederate victory, a little more than a year later, which led to General Lee's first invasion of the North. The 1,670-acre park includes portions of the two battlefields: from Henry House Hill, where the Administration-Museum Building and equestrian statue of Stonewall Jackson are located, is provided a panoramic view of the whole battle area. The museum, done in the best of modern museum technique, is open daily from 9:00 a.m. to 5:00 p.m.

Fredericksburg and Spotsylvania National Military Park, with headquarters and museum near the southern limits of Fredericksburg, includes scattered fields, totaling some 2,420 acres, which memorialize on the scenes of action

the major battles of Fredericksburg, Chancellorsville, the Wilderness and Spotsylvania Court House. Its miles of original trench remains and gun emplacements are well preserved and are accessible by park roads.

At Chancellorsville it was that the famous Southern general Stonewall Jackson was mortally wounded, May 2, 1863, by mistaken fire of his own men. Included in the park, at Guinea Station, is the Stonewall Jackson Memorial Shrine with the house in which that beloved Confederate leader died. Also under the park administration is the Fredericksburg National Cemetery in which are buried 15,260 Federal soldiers, 12,770 of them unknown.

For four long and troubled years, Richmond, as capital of the Confederacy and "Symbol of the South," was the principal objective of the Federal Armies in the East. No fewer than seven separate "On to Richmond" drives were directed against the Southern capital and stronghold; two were turned back at Manassas, three near Fredericksburg, while two threatened the capital at close range.



The house where Stonewall Jackson died, Guinea Station, Virginia. The area is the Fredericksburg and Spotsylvania National Military Park

Petersburg National Military Park preserves the scene of the decisive military operations which resulted in the loss of Richmond and led to the surrender of Lee. Petersburg, in 1864, became the "final citadel of the Confederacy." There, for about 10 months, the strongest armies of the North and South, commanded by Generals Grant and Lee, respectively, engaged in a life-and-death struggle. In April, 1865, came the end. With Lee's withdrawal from Petersburg, the last hope for the Confederacy also departed. Richmond was evacuated; then came Appomattox.

The national military park which commemorates the crucial action at Petersburg was established by Act of Congress approved July 3, 1926, and contains about 1,500 acres. A museum, located at the famed Crater, and field exhibits, markers and monuments help the visitor understand the tremendous military operation which took place

(Continued on page 20)



The stone house on Warrenton Turnpike, Manassas National Battlefield Park, used as a hospital during two battles of Manassas

The land which is now Richmond National Battlefield Park, in eight parcels containing 684 acres, was acquired by a group of public-spirited Virginians unwilling to surrender the physical remains of the heroic defense of Richmond to possible exploitation or destruction. In 1932 they donated the land to the Commonwealth which, in turn, donated it to the United States, making possible the establishment of the park in 1944.

On the battlefield route, stretching over a 57-mile length, are preserved parts of the fields of combat, massive forts and an intricate system of field fortifications. Included in the park also are two houses with wartime associations: the Watt House in which Gen. Fitz-John Porter had his headquarters and the Garthright House which served as a Union field hospital. Headquarters for this extended park are at Fort Harrison, 10 miles southeast of Capitol Square in Richmond; it may be reached by driving east on Broad Street and then proceeding over Virginia Routes 5 and 156.



The Shenandoah National Park. Depicted here is one of its many nature trails, widely known for their beauty

WEED CONTROL

for better fishing

in FARM PONDS

By HENRY S. MOSBY

Unit Leader

*Virginia Co-operative Wildlife Research Unit**

Photos courtesy the author



Waterlilies are pretty, but undesirable in a fish pond. They are difficult to control once established. Repeated cutting and spraying will eradicate them if carried out over a period of years

FARM PONDS are increasing in popularity here in Virginia and elsewhere; more than 2700 farm ponds have been constructed in Virginia within the last decade and many others are under construction at this time. There are a number of uses to which these ponds may be placed, such as the storage of water for livestock, for irrigation and for fire protection, as recreational areas for swimming and picknicking, and as excellent fishing spots. Excessive plant growth in and immediately around a pond will reduce the value of the pond for all such uses. Perhaps more people use ponds for fishing than for any other single purpose and, popular opinion to the contrary, a weed-filled pond does not produce either a maximum fish population or the best fishing. Unfortunately, the control of these undesired plants, or "weeds," is a problem in practically all ponds after they are several years old. So, if a long standing farm pond is to produce fish as effectively as is desired, ridding the pond of weeds is as necessary as cultivating the vegetable garden for the same purpose.

The production of fish in a pond may be compared to planting a garden. When we plant our garden we like to have all the plant foods and sunlight made available to the vegetables we are growing and for this reason we see that all weeds are removed from the garden. In farm fish ponds, the principle is somewhat the same; we should eliminate the weeds from the pond so that the natural plant foods of the water, the fertilizer which we apply, and the space are made available to the fish in this pond so that they will grow and reproduce at the maximum rate. Most fish experts now agree that a farm pond should not support weeds if maximum fish production is desired. What, then, can we do to prevent the growth of such plants in our pond, or, if such plants are already present, how can we remove them?

In general, pond weeds may be controlled in one or more of the following ways: 1) by proper pond construction, 2)

by adequate—and timely—fertilization of the pond, 3) by manually removing certain plants, and 4) by chemically treating the pond weeds around the margins or within the water itself. Each of these methods of farm pond weed control is discussed in some detail in the Virginia Agricultural Experiment Station Bulletin No. 425 entitled "Weed Control in Small Ponds"; a copy of this publication may be secured upon request to the Experiment Station or the Wildlife Research Unit in Blacksburg.

The old adage that "an ounce of prevention is worth a pound of cure" certainly holds true in pond weed control. If a pond is constructed properly—that is, if the banks around the pond drop off as nearly vertically as possible to a depth of at least two feet all around the perimeter of the pond—this will eliminate many of the problems of weed control. Most water plants like relatively shallow water and if these shallow areas are eliminated as nearly as possible during the construction of the pond, the favored areas of weed growth are kept to a minimum. So, the extra time spent in cutting the banks of the pond as nearly vertical as possible to a depth of at least two feet is worth-while. The sedges, cattails, willows and waterlilies find shallow areas to their liking and these plants are particularly difficult to control. Eliminate their favored growing areas when you construct the pond and you avoid many of the problems of controlling the growth of these plants.

It is well known that plants require sunlight for proper growth and that if this sunlight is cut off, the plants beneath the shade are retarded or killed. This principle may be used in the control of weeds growing in farm ponds by the proper application of fertilizer. If a pond is fertilized, beginning in early spring, at the proper rate—about 100 to 150 pounds of a complete fertilizer per acre of pond surface per application—this treatment will result in a "bloom," or heavy growth of very small plants and animals. These organisms occur in such abundance that

*Release No. 52-8 of the Virginia Co-operative Wildlife Research Unit, Virginia Polytechnic Institute, Virginia Commission of Game and Inland Fisheries, Wildlife Management Institute and the Fish and Wildlife Service, co-operating.

they eliminate the sunlight. If the pond is fertilized at frequent intervals, beginning in March, and this bloom maintained during the growing season, this bloom will shade out many of the undesired weeds in the pond. Fortunately, the addition of the fertilizer to the pond is precisely what fish authorities recommend to supply the microscopic foods needed for the maximum production of fish. Thus, fertilizer serves the functions of controlling undesired plant growth and producing fish; fertilizer is a double-edged tool in fish production which is not used to the degree that its effectiveness justifies.

Some plants, such as willows, cattails, sedges and water-lilies, can be effectively controlled by manually pulling or cutting them at frequent intervals. Cattails and water-lilies are very difficult to control because of their extensive root development, and they should be pulled by hand when they first appear in or around a farm pond for once they become abundant in a pond their elimination often is difficult and costly. Pull or cut them when they first appear; this can be done easily at first, but the longer they are permitted to grow in the pond, the greater is the problem of getting rid of these weeds.

Herbicides, or plant killers, have come into general use within the last few years and certain plant poisons can be used in the control of pond weeds. Many of these herbicides are very toxic both to plant and animal life and they must be applied at the proper rate and must be used with



Sedges should be pulled by hand. These plants seldom invade deeper water, but they do afford mosquito breeding areas if not removed

caution. Too large an application may kill the fish in the pond as well as the weeds; *if you use herbicides, use them cautiously and strictly according to directions.*

Herbicides which may be used in pond weed control include both organic materials (2,4-D, 2,4,5-T, TCA, and related chemicals) and inorganic chemicals (copper sulphate or bluestone, and sodium arsenite). The organic plant stimulants, such as 2,4-D and 2,4,5-T, are most effective when used as an oil spray on the marginal weeds, including such plants as cattails, milfoil, parrot's-feather, sedges, willows and similar plants which normally occur

around pond margins. The inorganic chemicals, which include copper sulphate and sodium arsenite, normally are used to control aquatic plants which occur in the water. These latter water-loving plants may be free floating algae, or scum, and bottom-rooted plants like water weed and coontail.

The newly developed organic chemicals—2,4-D and its relatives—should be applied to the pond margin plants at the rate recommended by the manufacturers. As mentioned previously, these chemicals dissolved in kerosene or light fuel oil normally are more effective than if used as a water spray.

One of the problems encountered in the use of inorganic herbicides in pond weed control is the calculation of the dosage. The dosage is calculated on the basis of pounds of the chemical per million pounds of water. Thus, it is necessary to determine the approximate weight of the water in the pond before it is possible to calculate the amount of chemical that should be applied for weed control. This calculation involves only simple arithmetic and may be best illustrated by an example: Suppose we had a pond that was 0.6 of an acre in surface area and we took enough soundings to determine that the average depth was four feet. Then, $4 \times .6$ equals 2.4 acre-feet of water in this particular pond. We know that each cubic foot of water weighs about $62\frac{1}{2}$ pounds and that there are 43,560 square feet to an acre. With this information we can determine by multiplying 62.5 by 43,560 that each acre-foot of water weighs 2,722,500 pounds. Thus, 2,722,500 multiplied by 2.4 is 6,634,000 pounds. Therefore, the water in our pond weighs approximately 6.6 million pounds and we should add 6.6 pounds of chemical for each part per million of the chemical we desire.

Copper sulphate will eliminate the algae—or scum—

Sedges have pretty well taken over this pond edge, affording mosquitoes a place to breed. Pulling by hand is the best solution





Pond "scum," or algae, is unsightly and undesirable. It can be removed from a pond by treating with one part per million bluestone

from a pond rather quickly. If applied at the rate of from one half to $1\frac{1}{2}$ parts per million, it is possible to get rid of this undesirable scum without injury to the fish population. In the example given above, we would apply 3.3 pounds of copper sulphate if we wanted to treat the pond at the rate of one-half part per million. We would have to apply 9.3 pounds of copper sulphate if we wished to treat the pond at the rate of $1\frac{1}{2}$ parts per million. The effectiveness of these chemicals often varies, depending upon the chemical qualities of the water in various ponds. For example, alkaline or hard water usually requires larger amounts of chemical than does soft or free stone water. Temperature, too, may affect the action of the chemicals as the action is speeded up in warm water and slowed down in cold water. For these reasons, it is recommended that the initial application of inorganic poisons be in the lower range suggested and, if such an application is not effective, treat a second time at a higher rate.

In general, copper sulphate applied at the rate of one half to $1\frac{1}{2}$ parts per million will control algae growth. Many of the rooted plants—commonly called water



A weed-filled pond is not a pretty sight—neither is it capable of producing many fish or as good fishing as a weed-free pond

grasses and including such plants as coontail, water weed and similar bottom-rooted plants—can be controlled by applying sodium arsenite at a rate of from 3 to 7 parts of sodium arsenite per million pounds of water. Both copper sulphate and sodium arsenite can be secured through many farm and orchard supply stores and they are best applied to the pond dissolved in water and put in the pond as a spray. Sodium arsenite is a violent poison and every precaution should be taken to see that it is not available to children or livestock.

Better fishing and more enjoyable fishing are insured by eliminating or controlling the weeds in your favorite farm pond. Anything that is worth having is worth work: it takes but little work to control the weeds in your pond if done at the right time and with the right method. Pond weed control, like garden weed control, must be done repeatedly. Weeding only once will not permanently eliminate all the plants either in the pond or in the garden. Anyone who has fished in a well-managed, weed-free pond will agree that the elimination of pond weeds pays dividends in better and more enjoyable fishing.

How Green Is Your Pasture?

Those of us who, through circumstance, environment or preference, confine our hunting to upland game birds, waterfowl or small animals, always look with wonderment, and often envy, on the annual big game harvest statistics issued by the states fortunate in substantial populations of big game animals.

Wyoming recently issued big game harvest figures for the 1951 hunting season, with what to many of us is an astounding total of 11,223,819 pounds of big game meat.

A breakdown of the figures reveals the deer out in front as the provider for the Wyoming hunters' larder. A total of 32,072 of these animals was taken during the hunting season for a total of 4,103,600 pounds of "bog-dressed" meat.

The elk was second in line. The harvest yield was 11,814 which produced 3,689,534 pounds. Antelope in

the number of 39,072 contributed 3,145,200 pounds, while 320 moose weighed 178,425 pounds. The number of bear taken, both black and grizzly, was 366, weighing 103,000 pounds. Thirty-three mountain sheep rounded out the picture with 3,960 pounds.

With the price of meat in the stratosphere, this sort of figures make the sportsmen in Virginia and in other states feel that the grass is certainly greener in Wyoming pastures. But think about Virginia's wildlife kills of 2,148 turkeys, 148 bears, and 7,514 deer during the 1951-52 hunting season. Add to this several hundred thousand rabbits, and the same number of squirrels. Perhaps our own pastures are also green. How much would you pay for all that meat at the local market? How much is wildlife in Virginia worth to you?

Hawks

You Should Know

By FREDERICK L. HUTCHISON

SOARING HIGH in the sky you see a "chicken hawk." There is a sudden, uncontrollable urge to destroy this destructive bird of prey. To the farmer and sportsman the word "hawk" usually means two things, destroyer of poultry and game. Before we pass judgment on the "chicken hawk," let us look at some hawks that are found in Virginia and see the economic importance they play in agriculture and wildlife conservation.

Because some of the hawks undeniably kill poultry and game, men have condemned all hawks to the "firing squad." Studies show that all but three species actually do more good than harm. The goshawk, Cooper's hawk and sharp-shinned hawk are the ones that have acquired the name "chicken hawk" and fully deserve the death sentence that farmers and sportsmen have passed upon them.

Let us study the description of these three marauders and learn the damage caused by them. First there is the smallest, the sharp-shinned hawk. This bird is approximately eleven inches long, not much larger than the robin. He is bluish-gray above, white with brown on the underside with a barred, slender tail. Don't let his size fool you; he is sure death and destruction on birds from doves and woodpeckers to the tiny warbler. A. K. Fisher, in the publication "The Food of Hawks and Owls," states that examinations of 107 stomachs containing food, 103 contained the remains of birds. The sharp-shinned is extremely fond of baby chickens and has been known to exterminate whole broods.

The Cooper's hawk, sometimes known as the blue darter or striker, is a large and fiercer version of the sharp-shinned. The plumage of the Cooper's hawk is almost identically the same as the sharp-shinned. The only noticeable difference, at a distance, is the size and the end of the tail which is rounded.

Fortunately, we are not too much concerned with the goshawk in Virginia, as his habitat is usually the northern hemisphere. He is seen in Virginia only on rare occasions. When food is scarce in Canada he may drift over the border in search of food, otherwise little is seen of him. The goshawk is about twice the size as the sharp-shinned hawk and is the fiercest and most destructive of the three species that have acquired the name "chicken hawk." To show the fierceness and bravery, it has been said that this hawk will take a wounded bird from the feet of the hunter. The markings of the goshawk are practically the same as the Cooper's hawk; about the only noticeable difference is the larger size.

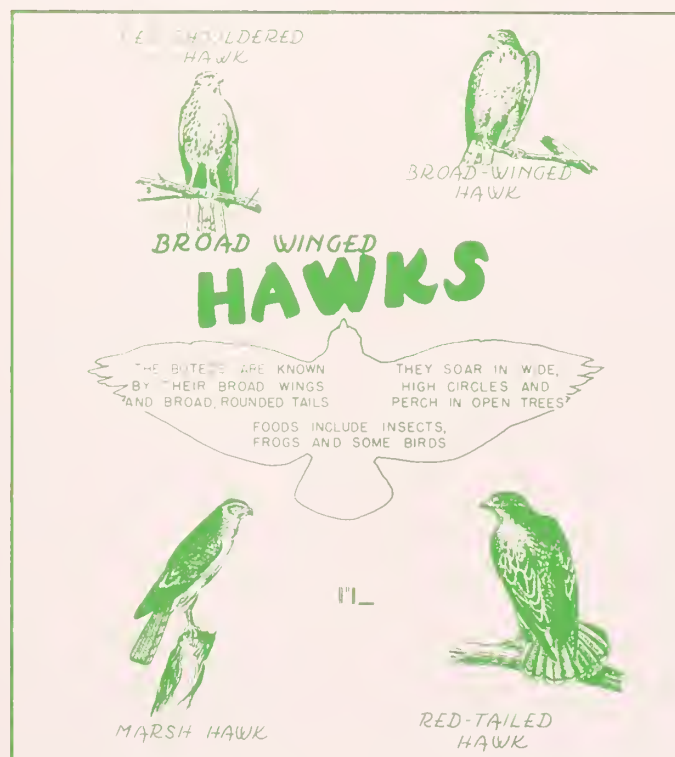
The "buzzard hawks" are truly friends of the agriculturist and wildlife conservationist. These slow flying hawks do much good by destroying insects and many kinds of harmful rodents. Some may occasionally kill poultry if the food is scarce, but should be spared the fate of the "chicken hawk" as their diet consists mostly of snakes, frogs, insects and field mice. They have been made to suffer the sins of their murdering relatives.

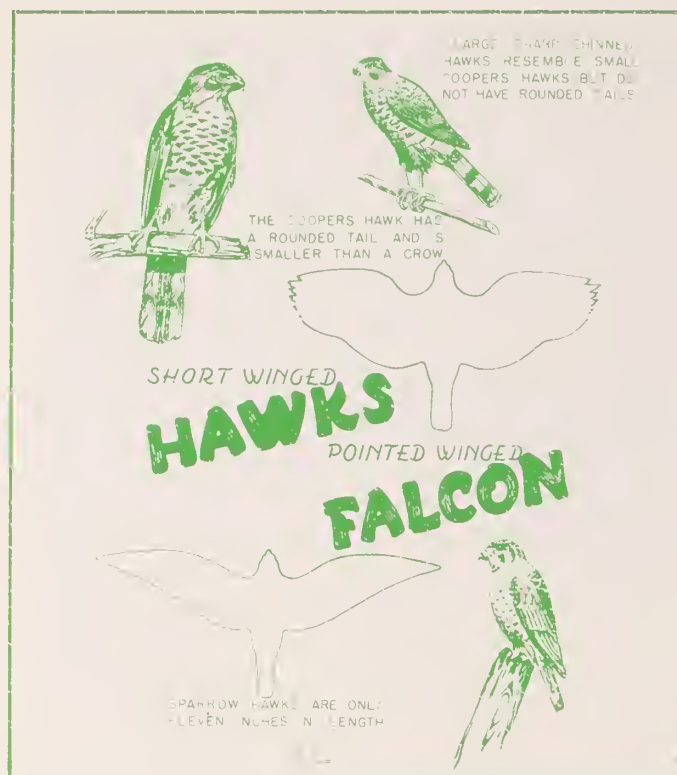
The "buzzard hawks" are distinguished from their destructive kin by their slow flight, broad wings and a tail that is wide and rounded.

The varieties that should be carefully protected are the red-shouldered hawk, red-tailed hawk, unjustly called "chicken hawk," the broad-winged hawk, which is the smallest of the "buzzard hawks" and lastly the great destroyer of mice, the marsh hawk.

The marsh hawk, as the name indicates, is usually found flying close to the ground looking for movements in the grass around marshy meadows and swampy areas. It is here that this hawk gets its food which consists mainly of snakes, frogs, and mice. Marsh hawks rarely seize poultry and should be protected by landowners and sportsmen as one of the most useful and persistent mousers. This hawk has been known to take as many as 500 mice during the nesting season. This destroyer of mice may be easily recognized by a broad white patch on the rump.

The most colorful of the hawks is the sparrow hawk. His back tawny, wings bluish and black, tail hewed in chestnut and head dotted with black splotches make him a truly magnificent bird. This eater of grasshoppers and other pests of agriculture has been mercilessly killed because of its similarity in size to the destructive sharp-shinned hawk. Occasionally it may seize a young chicken to feed its young, but the damage is nothing in comparison with the good accomplished.





The sparrow hawk may be distinguished in flight by long pointed wings and a lengthy narrow tail. Usually he is seen perched on telephone wires or hovering motionlessly over a grass or hay field looking for mice, one of its favorite foods.

The diet of hawks differs greatly in the eyes of the public and scientific research. Up to about 40 years ago hawks were divided into two groups, the "hen hawks" (now known as "buzzard hawks") and "chicken hawks." All these hawks were believed to feed exclusively on poultry, small game birds and animals. In many cases,

bounties were placed on their heads and farmers and sportsmen were turned against them. Scientists began to study the actual feeding habits of these birds and to report accordingly as to the outcome.

How, you may ask, do ornithologists study the feeding habits of these birds of prey? The hawk, in devouring its catch, consumes not only the flesh of birds and animals, but the bones and fur or feathers as well. They usually swallow them whole. Material which is not digested is thrown up in spindle-shaped masses called pellets. Ornithologists collect the pellets and by careful examination can determine the material on which various hawks feed. It is from examination of the pellets that the beneficial and non-beneficial hawks are divided.

Here are the results of research on the feeding habits of one of the beneficial hawks, the red-tailed hawk: snakes, frogs and other animals—37 per cent, mice—40 per cent, insects—8 per cent, poultry—15 per cent. With only 15 per cent poultry and other birds, how can we condemn these hawks to the fate of the "chicken hawk?"

Mother Nature has many ways of maintaining the balance of nature that we will never understand, but if you, the conservation minded people of Virginia, will attempt to preserve the hawks that are decidedly beneficial, agriculture and wildlife will benefit tremendously.

Henry Wadsworth Longfellow summarizes the situation most appropriately in his poem, "Birds of Killingworth."

The summer came and all the birds were dead;
The days were like hot coals; the very ground
Was burned to ashes; in the orchards fed
Myriads of caterpillars, and around
The cultivated fields and garden beds
Hosts of devouring insects crawled, and found
No foe to check their march, till they had made
The land a desert without leaf or shade.

BIRD OF THE MONTH

The Nighthawk

WHAT'S IN a name? "That which we call a rose
By any other name would smell as sweet."
So says Shakespeare.

The Book of Proverbs says, "A good name is rather to be chosen than great riches."

And still another old saying is this: "Give a dog a bad name, and you'd just as well kill him."

And so it is with the nighthawk. Back yonder in the Middle Ages the European peasants thought these great-mouthed, night-flying birds sucked milk from their goats. And today, while we know this thing is impossible, in our scientific books the nighthawk is classed in the family of the goatsuckers.

The family of goatsuckers is divided into the sub-family of the "true" goatsuckers (which includes the whip-poor-will, the chuck-will's widow, and others) and the sub-family of the nighthawks.

And here again our "Bird of the Month" is in trouble. The state of Pennsylvania placed a bounty on the head of every hawk. The nighthawk has its diet entirely of insects. Into that wide-open mouth go daily thousands of mosquitoes, flies, boll-weevils, etc. It is totally beneficial. But the state authorities ruled that because the "books" called it a hawk, it came under the law, and the bounty must be paid. Hundreds of nighthawks perished.

But why call a bird a bat? Note the flight of the leather-winged bat. Very similar is that of the nighthawk. When the nighthawk is making his courtship display, one of his most winning ways with his lady is to rise high in the air, and suddenly to zoom down above her, turning as suddenly with wings set and the air rushing through the primary feathers. This produces a booming, bellowing sound. Therefore our bird with the bat-like flight and the bellowing sound is known as the bullbat.

CONSERVATIONGRAM

Late Wildlife News . . . At A Glance

COMMISSION CONTRACTS FOR NEW FISH POND IN PITTSYLVANIA COUNTY: Late in June the Commission awarded the contract for the construction of a new fish pond in Pittsylvania County to the English Construction Company, Altavista, Virginia. The new 80-acre pond site is located on Highway 800, about 8 miles west of Highway 29. It is hoped that the construction will be completed and the pond stocked with bass, bream, and crappie by the Christmas holidays.

NEW 3-DAY NON-RESIDENT FISHING LICENSE ONLY GOOD IN ONE INTERSTATE IMPOUNDMENT:

The recently announced 3-day special non-resident fishing license will be good only in one of the state's three interstate impoundments for the present time—South Holston Reservoir, Washington County. In the other two interstate impoundments, Buggs Island Reservoir, between North Carolina and Virginia, and the Bluestone Reservoir, between West Virginia and Virginia, when a reciprocal agreement is entered into between Virginia and the respective adjoining states, upon the effective date these special non-resident three-day fishing licenses shall become valid therein.

I. T. Quinn, executive director of the Commission, emphasizes the fact that this new license is good only on Holston Reservoir at the present time.

COMMISSION'S ASSISTANT FISH DIVISION CHIEF TO LEAVE SEPTEMBER 1: Dr. Dean A. Rosebery, assistant chief of the Commission's fish division, will leave the Commission on September 1, to become a Professor of General Science at Northeast Missouri State Teachers' College, Kirksville, Missouri.

In commenting on his new position, Rosebery said that the general science courses that he will teach are designed to give future teachers an insight to the many physical and biological sciences which are considered so important to everyday living.

QUINN'S STATEMENT ON TACKETT BILL PRAISED BY OWAA: (Editor's note: The hearings before the House Agriculture Appropriation Committee on the Tackett Bill (H.R. 565) were heart-warming to sportsmen and all lovers of the out-of-doors. Favorable testimony given both by personal appearances and in written form impressed the Committee with the wide and active interest in the measure. One of the strongest and most explicit statements was sent by I. T. Quinn, executive director of the Virginia Game Commission, for the hearing on April 8, 1952, and made a part of the record. Quinn spoke for the International Association of Game, Fish and Conservation Commissioners and for the Southeastern Association of Game and Fish Commissioners as well as for his own department.)

The Outdoor Writer's Association of America praised Quinn's statement and sent a copy of it to all of their members. Some excerpts from that statement were as follows:

"The Federal Government owns 180,000,000 acres of national forest land on which there are 81,000 miles of fishing streams, 635,771 acres of reservoirs, and 1,554,086 acres of natural lakes. There are 133,920 miles of forest highways and forest development roads. Added to this, there are 129,200 miles of forest trails . . .

"In 1951 5½ million hunters and fishermen enjoyed the woods and waters of our national forests. One and a third million big game hunters bagged 350,000 animals. Seven hundred thousand small game hunters sought turkeys, grouse, squirrels and other small game. Three and a half million anglers fished the streams, reservoirs and lakes . . .

"Forest Service appropriations for sanitation cleanup and maintenance of improvements of recreational areas total about \$1,000,000 annually, of which about \$400,000 is for maintenance of improvements. The replacement value of these improvements is estimated at \$75,000,000.

"Here, gentlemen, is a Federal agency that each year operates in the black; its receipts are more than its disbursements, and, on the other hand, the demands on this agency are far greater than its financial ability to adequately serve the public.

"H.R. 565 simply asks you to give favorable consideration to the application of ten per cent (10%) of national forest income to develop and maintain forest recreational facilities and expand them to meet the ever-increasing demand of the men, women and children of this country. This is good government. God must have loved the great outdoors because He made so much of it"



▲ Show-me trip begins with a carefully prepared itinerary and map. Left to right: Pete Hanlon, administrative assistant George Washington National Forest; I. T. Quinn, executive director Game Commission; E. M. Karger, George Washington Forest supervisor; T. G. Herring, Game Commission member; and C. F. Phelps, chief of the Commission's game division



▲ Forest and game officials inspect Sherando Lake Recreation Area where thousands of visitors and campers may be seen on pleasant weekends and holidays. Commission stocks bass in lake each year. Trout from the U. S. F. W. S. have also been stocked in the cold lake. The area is 14 miles southwest of Waynesboro



▲ Looking northwestward toward Elliot Knob from atop the famed Blue Ridge Parkway. Show-me trip covered a territory of some 3,000 square miles of forest public domain in the rugged Allegheny mountains



▲ Group inspects one of the many salt licks used by deer. Note tongue marks on salt block. Wildlife workers make effective use of salt to hold deer in some areas or draw them away from croplands

SHOW-ME through the GEORGE WASHINGTON NATIONAL FOREST

Virginia's tremendous forest resource of 1,500,000 acres of public domain is the largest of any state. Here exemplary work is done in wildlife through Pittman-Robertson and federal dollar forest stamp, plus the cooperation between the U. S. Forest Service and Game Commission.

Here in picture story are some highlights of the program on the George Washington National Forest done on the Jefferson.

Commission, photo

▼ Another example of forest-game habitat improvement! This is a "bear wallow" in a forest clearing. Hundreds of watering holes for wildlife have been created on the two national forests



▼ Commissioner Herring shows bear damage. For some unexplained reason black bear delight in wrecking forest signs. Animals are holding their own on the forests, increasing in some areas





Forest supervisor Karger points to the North River watershed being managed for water needs of Staunton and surrounding cities. Stream is stocked annually with brook trout. A cloudburst in 1949 caused serious flood damage and scoured out the river bottom so that stream improvement is badly needed ▲



▲ Pete Hanlon (left) and game manager "Cam" Huffer indicate a seeded forest road planted for wildlife. Co-operation between U. S. Forest Service, Soil Conservation Service, and the Virginia Game Commission made this seven-mile food strip possible; similar road projects cover other areas in the forest

TRIP of the WASHINGTON FOREST

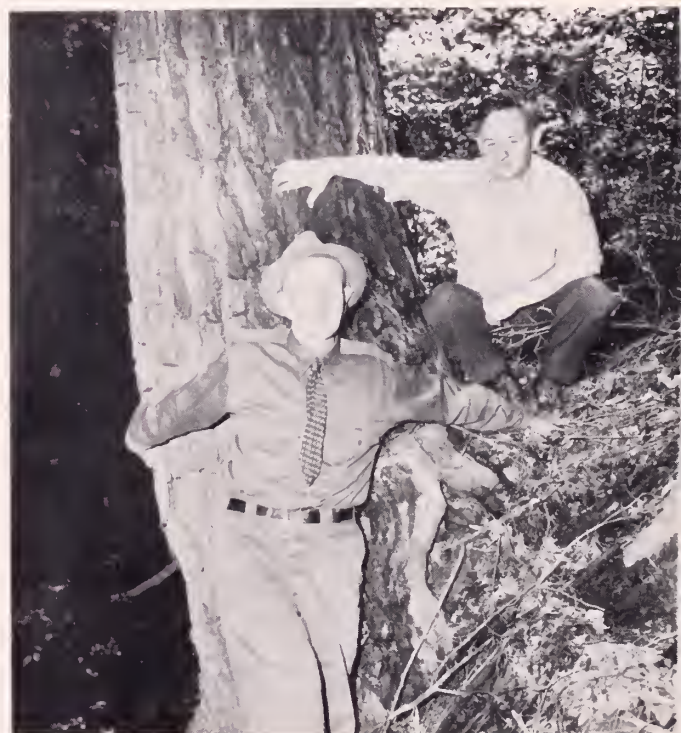
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Game manager "Goldie" Smith (left) and district ranger Dick Elliott pose beside big hemlock on the upper reaches of Dry River. Forest uses are water, recreation, and timber in that order ▲



Key to the big forest-game program is mountain clearings for wildlife. Some 3,500 of these half-acre to one-acre areas have been established and planted to deer, grouse, and turkey foods ▲



Assistant ranger Sedgwick Watson (left) shows how serious overbrowsing can be. Some sections have too many deer for the food supply available. Result, starving deer herds! Note this eaten-out, park-like forest area near Douthat State Park ▼

District forest ranger Jack Hicks (left) shows group a model camp site. This one at Bubbling Springs on the Warm Springs Ranger District is maintained for use by hunters and fishermen ▼



WILDLIFE WATERLOOS

By C. H. SHAFFER

Commission game technician

Commission photos by Kesteloo

WHEN WE CONSIDER everything that can and does happen to our wildlife, it is surprising that any large populations of our game species still remain. All of our animals and birds must run a continual gauntlet of hazards throughout their life spans combating the forces of man and nature alike. Some individuals survive—many do not. That animals and birds do survive and even increase under greatly changing conditions in their environment gives one a fuller appreciation of the resourcefulness of the creatures of the wild.

If our objective is the conservation of wildlife, then we must discover what is happening to the coveted species and attempt to do something about the killing factors. Most sportsmen now recognize the toll of wildlife populations taken from us by starvation, predation, hunting and crippling losses, disease, parasites, and by inadequate food and cover. In addition, there are a great many physical hazards to which all the various animals and birds are subject every day of their lives. These individual accidents and the resulting losses go unnoticed and blame is often charged to other factors. Individual mishaps may actually be insignificant to the total game populations, but collectively they cause a considerable drain on breeding populations, resulting in a lesser game harvest in the field during hunting season. Many accidents that destroy our wild creatures cannot be prevented, since ordinary man, with all his knowledge of science and nature, has not learned to control weather or the innate habits of animals and birds. Nevertheless, there exists certain wildlife hazards which are entirely man-made and, therefore, can be prevented. In this discussion, we should like to elaborate on some types of accidents helping to deplete wildlife populations, in the hope that sportsmen will want to do something to prevent the man-made losses.

In analyzing the uncontrollable accidents we find that some are only peculiar to a certain species and result from the particular habits of that animal or bird. For example, the highly prized antlers of a buck deer on occasion will lead the buck to his doom outside of hunting season. We have all heard or have seen evidence of the interlocking of antlers of buck deer during the premating quarrels, which inevitably lead to starvation and eventual loss of one or both individuals. Bucks have been known to become entwined in a woven wire fence, and the great speed and



Improved roads, increased speed, and powerful vehicles are gathering a larger yearly harvest of wildlife populations

leaping ability of the deer sometimes lead to broken legs and eventual death. Recently a fawn was found on the Buckingham State Forest completely "hog-tied" in a dense honeysuckle thicket. Doves build flimsy structures to serve as nests and as a result, both nests and eggs are sometimes destroyed during heavy storms. The same fate probably befalls young squirrels in poorly constructed leaf nests. Upland game birds and waterfowl have been found dead, presumably from flying into trees, power lines, lighthouses or buildings. The remains of rabbits, foxes, skunks and other mammals have been discovered in open wells and mine shafts. There are numerous other examples that could be cited where birds and animals lose their lives in uncontrollable accidents.

Some of the most serious accidents to animals and birds are caused by the weather and, naturally, nothing much can be done to abate them. Virginia's favorite upland birds, quail, grouse and turkey, all build nests on the ground usually in shallow depressions and often on low ground where they are subject to flooding. Flash floods or prolonged rains thus can cause the complete loss of a hatch of eggs. Even after hatching deluges or heavy rains often cause the death of the young, either directly or indirectly. It is not too uncommon to find immature quail and turkeys in roadside or drainage ditches. Occasional reports tell of quail chicks being found dead in dense stands of water-soaked lespedeza fields. Turkey poults also may succumb after excessive chilling and exposure. Actually, the success or failure of a nesting season depends to a considerable extent on the relative amount of precipitation during the spring of the year.

During the winter season wildlife is subject to additional hazards. When low temperatures are accompanied by snow and ice, game is not only forced to battle the elements with a minimum food supply and reduced cover, but frequently quail and rabbits become completely encased in ice and perish. During the severe winter of 1947-48 an Appomattox school boy reported finding two

complete coveys of quail encased in ice on his father's farm. Rabbits meet similar fates when weather conditions are critical. It is indeed fortunate that throughout most of Virginia persistent ice and snow do not occur frequently.

There are a number of other accidents which tend to deplete wildlife populations, all of which are, to a certain extent, avoidable or controllable. These mishaps generally can be classified in three categories: losses from fire, losses by mowing and clean farming, and casualties on the highways. With more care, greater thoughtfulness, and less speed it would appear that a needless drain on our wildlife populations could be prevented.

It is not difficult to visualize what happens to our birds and animals during a field or forest fire. Not only is the habitat destroyed, but often the creatures themselves perish. Too often fires occur during the peak of the bird nesting season, resulting in the loss of entire coveys of birds or gangs of turkeys. The usual fire season in the spring is also the period when fawns are being dropped and rabbits are having their first litters. In Virginia, the State and National Forest Services have done an outstanding educational job in painting this gloomy picture. The public has responded well to the pleas for prevention of fire, and as a result, losses to timber and wildlife are diminishing yearly.

The farm game species—quail and rabbits—have apparently been affected by mechanization more than other wildlife, since they are so definitely a product of land-use. Mechanized equipment has resulted generally in more land being cleared, intensified farming and clean fence rows. Many parts of Virginia are well suited to beef and dairy production, resulting in more pastures and hay-fields. Not only are the quail and rabbits forced to contend with reduced habitat, but the chances are that their nests or beds will be destroyed or molested by mowing machines. It is most unfortunate that the haying season

and nesting season usually occur at precisely the same time of the year and result in an untold number of accidents to our wildlife. It is regrettable also that quail, rabbits, and sometimes turkeys continue to nest in hay or small grain fields.

Just recently we received a report of a turkey nest being mowed over; the hen had remained faithfully on the nest and the mowing blade sheared off both her legs. This hen, and her potential flock of ten, will never provide recreation and sport for anyone. A rather ironical case was reported during last spring; the farmer was in the process of plowing a quail food patch for the benefit of these birds the following winter, and in the operation he plowed up a quail nest containing 17 eggs. If the nest is destroyed, the quail hen will usually try again elsewhere, unless she has fallen prey to the mowing blade or plow. Perhaps by providing nesting cover such as *Serecia lespedeza* elsewhere on the farms these animals and birds could be decoyed away from the hay or grain fields. Flushing bars have proved largely impractical, but often a farmer is able to save the eggs or young by working and watching carefully, and mowing around nests discovered in time. Recently the Orange County Game Protective Association, realizing the large loss of quail from mowing operations, set up facilities for receiving and hatching out quail eggs discovered by the farmers in that county.

The most familiar accidents to all of us are those that occur on our highways. We can see evidence of nature's clashes with "four-wheeled predators" on almost every road we travel. Improved roads, increased speed, and more powerful vehicles appear to be gathering a larger yearly harvest of wildlife populations. Whenever animals and birds are killed on the highways no one benefits but the scavengers (vultures and crows). Their potential recreational and aesthetic values are lost forever.

In Buckingham County a truck recently struck and killed two doe deer. When examined they were found to be carrying a total of three unborn fawns (two does and a buck). Thus five deer were actually destroyed in this one mishap. If we were to speculate on the breeding potential of four mature does (if they had survived), the true loss could then be approximated. Earlier, on this same highway, three additional deer were killed in a similar accident.

If you want to make an interesting observation some day that will reveal the amazing loss of wildlife on the highways, just keep records of the number and variety of animals and birds you see killed on a measured distance. Be sure to start early in the morning before nature's scavengers have removed the evidence. When you have reached your destination, add your kill figures, multiply this figure by 365 (days), and then multiply again by the number of miles of highways in Virginia. Your results probably will not prove anything since there are so many variables involved. However, you will have some indication of what happens to a portion of our wildlife.

The nocturnal animals—those that move about more readily at night—appear to be the most frequent victims. Rabbits and the unwanted skunk possibly will lead the list of highway casualties, followed by opossums, raccoons,

(Continued on page 20)



Evidence of nature's clashes with "four-wheeled" predators is found on every Virginia highway

The RED-COCKADED WOODPECKER

By C. C. STEIRLY

Member, Virginia Society of Ornithology

Commission photos by Kesteloo

MANY FORMS of bird and animal life are quite adaptive to radical changes in their environment. These successful creatures are able to adapt themselves to new habitat niches created by man's alterations of the natural habitats and of the landscape in general. Other forms however are never quite able to adapt themselves to changing conditions. Some in fact are so restricted in their adaptiveness that they are unable to cope with the changes created by the harvesting of certain timber crops. These forms thus must move on to an area where that certain habitat still exists or else they fail to breed and soon join the ranks of species on our list of has-beens. In the deep south the ivory-billed woodpecker is an excellent example of a species doomed to extinction because it cannot or will not change its mode of life. As the virgin stands of swamp hardwood are rapidly falling before the lumbermen's axe the species is now left with but a few acres of its habitat.

We have in Virginia a species of woodpecker, the red-cockaded woodpecker¹, that eventually will probably be another "has-been" as far as the Virginia avifauna is concerned. This species is one of eight species of woodpeckers recorded for Virginia in the Virginia Society of Ornithology Check List². Virginia's list of woodpeckers, most of which are permanent residents, includes the pileated, hairy, downy, red-headed, red-cockaded, red-bellied, flicker and yellow-bellied sapsucker. The red-cockaded is easily distinguished from the others by the distinct "ladder-back" effect of alternate black and white bands all the way across the back and by the white sides of its head. All woodpeckers have some red about the head varying from the flaming red crest of the pileated to the scarcely-noticed patches on the downy.

The red-cockaded woodpecker is a bird of the deep south; a bird most characteristic of the piney woods or flatwoods of the Carolinas, Georgia and Florida. Here in Virginia it has been seen in several southeastern counties and is recorded as far north and west as Chesterfield County (Pocahontas State Forest). However, as a breeding bird it is found only in Southampton, Sussex, Nansemond, Norfolk and Princess Anne counties. In



these counties, whose forest areas consist for the most part of pine, even-aged stands of loblolly pine, the bird occasionally finds conditions similar to the flat pine woods of farther south. Despite the extensive range of pine stands in these southeastern counties the red-cockaded remains a rather rare species since it is restricted to only certain types of pine forests. It is at home in those mature stands growing on rather dry sites fairly free of dense undergrowth. It does not adapt itself to dense growths of pine, but prefers the more open, scattered growths of pine.

On entering such a piece of woods one first becomes aware of the presence of this species by noticing scattered pines with long white streaks on the upper boles. In fact the streaks give the appearance that portion of the tree had been dipped in candle wax. Often these streaks extend vertically as much as fifteen feet. Closer inspection will reveal a hole two or three inches in diameter in the mid-portion of the white streak. A further inspection will reveal that these streaks are deliberately caused by numerous chippings up and down the tree from the hole similar to the turpentine workings of men in Georgia and Florida. These white streaks are the exudations of resin or pitch from the pine. They are made by the red-cockaded woodpecker supposedly as a defensive measure against any enemy that might attempt to molest the nest cavity.

The red-cockaded woodpecker is the only bird that excavates its nest cavity in the living pine tree. It returns to the same nest tree year after year freshening the resin streaks by making more and more chippings through the bark of the tree. If the tree should die the bird will abandon it and make its cavity in another suitable living pine tree.

The writer, in following up logging operations in the southeastern counties, has had ample occasion to study these nest cavities and to relate their occurrence to tree growth and vigor. Invariably the bird selects an old-age tree that has become infected with red-heart, a fungus disease attacking the older loblolly pines and ruining large portions of the boles for lumber. This particular tree disease is one of great economic importance and it is

¹*Dendrocopos borealis*.

²A Check-List of the Birds of Virginia: J. J. Murray, Virginia Society of Ornithology, 1952

fortunately an old-age rot producing disease confined most generally to trees of 80 years or more in age, long after the tree has made its best economic growth, *i. e.*, generally 70 years is considered as the economic maturity of the loblolly pine. Beyond that age the growth does not amount to very much and the tree becomes susceptible to disease as well as insect attacks.

It has been found, through observing saw cuts through the woodpecker boles, that the bird selects an old branch stub where the woody substance is somewhat rotten and easily worked. Tunnelling is begun through this branch

stub to the softer decadent center of the tree. There a cavity is excavated some 6 or 7 inches in depth. The next step, prior to egg laying, is to make the characteristic chippings or markings on the outside of the tree above and below the hole. When these markings are completed that section of the tree becomes coated with a sticky mass of resin which upon exposure to the air takes on the whitish, waxy appearance. Such nest cavities are never found in any but red-heart infected living pines; in our area either the loblolly or the shortleaf

The red-cockaded woodpecker is the only bird that excavates its nest cavity in the living pine tree. Shown here is a typical cavity in a loblolly pine

pine but most commonly in the loblolly pine.

A typical nest tree out near Sussex, Virginia revealed the following information: hole 3 inches in diameter, 42 feet up the tree. Tunnel 9 inches back, nest cavity 6.75 inches deep, 1.5 inches excavated above the tunnel. Pitch or resin streaks worked 6 feet above the hole and 13 feet below it. Age of tree 95 years.

The average age of dozens of such nest trees has been determined to be 91 years by the writer using a forester's increment borer. The youngest nest tree found thus far was one of 75 years, growing on very poor soil and heavily infected with red-heart disease. Loblolly pines of these ages are hardly maintaining any growth. Growth per cents, calculated by foresters, for such trees range from .4 to 1.3 which is very low for pine tree growth. Such growth, on a per acre basis, is more than offset by the increase of the ravages of the red-heart disease. Good forestry practice would dictate the immediate felling and regeneration of such stands of timber in order to keep the forest productive.

Since the red-cockaded woodpecker does not adapt itself to nesting in other kinds of trees, or even in dead pines, its doom in Virginia is almost assuredly sealed. With our pine forests being cut faster than they are growing it is merely a matter of time before these older stands of loblolly pine are cut, utilized and regenerated to thrifty young stands of pine capable of growing at the rate of 15 to 20 dollars per acre per year. As these old stands are cut it is doubtful if present day middle-aged stands (age 40 to 50 years) will be permitted to reach a stage of maturity where they will be useful to the red-cockaded woodpecker. This bird of the living pine is thus passing away as the forests of mature pine are becoming less and less a feature of the landscape of our southeastern Virginia counties. Even if nest trees are left as scattered seed trees, it is doubtful if the bird will remain since scattered seed trees, perhaps four to eight per acre, would not constitute enough of a stand to preserve its deep south-like habitat.

The northmost nest tree of this species, observed by the writer, is one of two loblolly pines on Highway 460 near Wakefield in Sussex County. An observer roaming the haunts of this species will find a few other birds that are more characteristic of the Carolina low-country pine forests. These are the brown-headed nuthatch, pinewoods sparrow, pine warbler and prairie warbler.

The author (left) shown examining a red-cockaded nest tree. The hole is three inches in diameter and nine inches back into the trunk

NATIONAL PARKS IN VIRGINIA

(Continued from page 7)

there. Poplar Grove National Cemetery, 3 miles south of Petersburg, also is in the National Park System. It



Top photo: A wartime view of the McLean House, where General Lee surrendered to General Grant, Appomattox Court House

Bottom photo: The McLean House after it had been completely restored by the National Park Service in 1949

holds the remains of about 6,000 Federal soldiers.

In the McLean House, now reconstructed in Appomattox Court House National Historical Monument, took place the greatest one-act drama in our national history. The principal actors were Lee and Grant. They met, that Palm Sunday, April 9, 1865, and brought to an end the ruinous war. There was, as of that moment, "brought forth upon this Continent, a new nation . . ."

The national historical monument, entrusted to the National Park Service to preserve for the American people for all time, was established April 10, 1940, practically the 75th Anniversary of the surrender. Its somewhat less than 1,000 acres hold the old village of Appomattox Court House and the ground made memorable by the closing scenes of the war.

The National Park Service areas in Virginia and elsewhere, from Hawaii to Puerto Rico to Alaska; from California to Maine, from Florida to the state of Washington, are dedicated to conservation along with non-destructive use. The wording of the organic Congressional Act of 1916 establishing the Service gives the picture with clarity not always found in a legal pronouncement: "... to conserve the scenery and the natural and historical objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

But the values of the segments of the National Park System are even more personal. Have you been thrilled by the great unspoiled wilderness of a national park; have you relived, at the scene, an event which shaped our history as a nation; have you stood silently by the graves—so pathetically many "unknowns"—of men who gave their lives in our country's battles? Then you have "enjoyed" some of the areas which the National Park Service is directed to preserve for you and for your children's children. You have experienced "recreation" in its original, classic meaning. Is it possible that you went away a better Virginian and a better American?

WILDLIFE WATERLOOS

(Continued from page 17)

foxes and deer. During the daytime squirrel, quail and grouse can be added to the list.

It is fully understood that some road accidents involving birds and animals are unavoidable. The driver can do nothing when a quail flies into his vehicle or a rabbit darts suddenly in front of his car. At night the animals appear fascinated, confused, blinded, or startled by the headlights of a car and often do the unexpected. Actually, if the choice on the highways came to either wrecking a car

and risking human life or running down an animal, the decision would not be difficult to make. However, the point we want to establish is that careful driving and reduced speed will help to prevent accidents and casualties of all types. Perhaps it is just wishful thinking to believe that a reckless driver will slow down for any form of wildlife when he apparently is not even interested in saving his own neck, but that is what we are asking. Actually, if those drivers interested in stopping highway kills would just use a little more care, especially on roads going through wildlife lands, the saving of our game crops would be unbelievable. Why don't you try it? Slow down, sportsmen!



The coffee-colored, fresh waters of Lake Drummond drain 750 square miles of inundated forest lands. It lies in the heart of the Great Dismal Swamp

Photo courtesy V. S. C. C.

NOT ENOUGH GAR and too many catfish sounds impossible, but these are the conclusions reached by Commission fish biologists after three days of running 2,000 feet of gill net through the depths of Virginia's unique, subtropical entity, Lake Drummond.

This study was instigated by fishermen, who for several years have complained that the bass had disappeared from Lake Drummond, and that no pike nor bluegills were being taken. Several years ago the area was ranked among the best bass fishing waters of the state. What happened to the bass? Fishermen and local sportsmen stocked over 400 bluegills in the lake four or five years ago, but no one has caught any bluegills since that time. What, also, happened to the bluegills?

Along with the comments from fishermen came reliable reports that in the last two years the fliers have grown to edible size, and that in the last few years the crappies caught in the area have been exceptionally large size.

These were the questions that had to be answered. All of them could not be answered in one trip to the area so the most important questions were selected and their answers were set up as the principle objectives of the study. Foremost among the questions to be answered were to determine what species were in the lake, and what factors were preventing the largemouth bass from becoming re-established.

Lake Drummond lies deep in the heart of the great Dismal Swamp. Its coffee-colored, fresh water drains from 750 square miles of inundated forest lands of gum, pine, cypress, and juniper. The lake itself is about 2 or 2.5 miles long and 2.5 or 3 miles wide, with a range in depth

from 1 to 3 feet at the shoreline to 8 to 10 feet in the lake center. Fallen trees, stumps, snags and debris cover the shoreline and lake bottom.

Equipment used in the lake study included 2,000 feet of gill nets having sizes ranging from 1" to 2" mesh, 2 fyke nets, fishing rods and lines, and 4 pairs of strong arms to lift the nets. In addition to the study made on the fish populations an analysis of the water was also made. The entire operation lasted for three days.

Some observations coming to light were that the fish population of Lake Drummond is indeed unique in its predator-forage fish relationship. The majority of coastal plain ponds and lakes in Virginia have the largemouth bass and pickerel as predators and the bluegills for forage. Lake Drummond has a predator population of gar, bowfin (grindle) and large crappie, with a forage fish population of fliers, bullheads (under 6 inches) and small crappie (under 6 inches).

The lake is overrun with bullhead catfish, which are stunted to a uniform size of 8 to 9 inches. Every net raised was entangled with undersized cats, and made gill netting a nightmarish task leaving the fish boys with pricked and bleeding hands and more than once with their patience at an end. Approximately 50 per cent of the fish taken were bullheads. Seven hundred fish weighing 249.4 pounds were caught in the nets, 412 of the fish with a weight of 122.9 pounds were yellow bullheads.

Fliers came second to the catfish in number but not in weight; the majority of this species was too small to be of interest to the angler. There were 209 of these undersized sunfish captured, and the entire lot of them weighed but 23 pounds. Of the 209 fish captured, 157



Before starting operations, the nets had to be mended. Dean Rosebery (front) and Bob Martin are shown hard at the task



With all equipment stored on the boat, the fish boys set out across the eerie looking waters to set the nets

were under 5 inches in length and 52 were over 5 inches.

Next in order of their numbers came the black crappie, of which there were 61 with a total weight of 37 pounds. This species showed excellent growth both in length and weight. The average length of a 6-year-old crappie was 11.7 inches and the average weight was just short of a pound or .96 pounds per fish. Compared to the 6-year-old flier which averaged only 7.6 inches in length and .30 pounds (charts A and B), the crappie population is making exceptional growth in Lake Drummond.

Other species included among the forage fish captured during the 3 day study were 5 golden shiners weighing 2.2 pounds, and 1 lake chub sucker weighing 0.5 pounds.

These were forage fish, but what about the predators? Two species make up the principle predator population in Lake Drummond. They are the bowfin (grindle) and the gar. Large crappie also is an effective predator and

must be recognized as such. Six bowfin weighing 26.3 pounds, 5 gar weighing 36.2 pounds, and 1 chain pickerel weighing 1.3 pounds were taken from the lake. There is a pretty high population of gar and bowfin but it is still too low to reduce the number of bullheads appreciably. They are, however, holding the number of fliers down so that they should soon attain a reasonable fishable size.

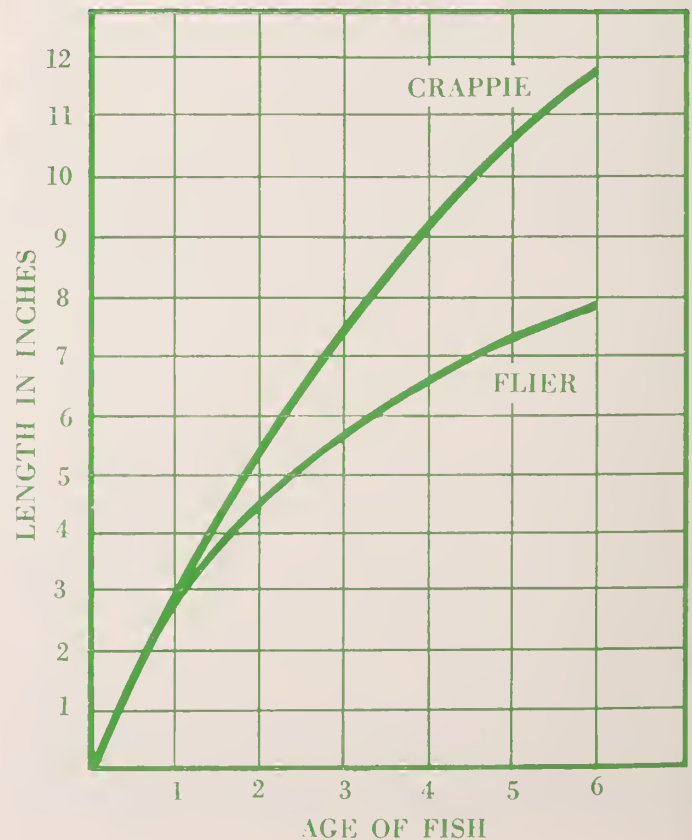
In the water pH analysis of samples taken at 3 widely separated points it was found that the average was 5.2, a pH normally too low for bass production.

It was concluded from this study that there is an overpopulation of bullhead catfish; that there is a high population of gar, bowfin, and fliers; there is a low population of crappie and that the acid waters (pH 5.2) probably prevent the successful establishment of largemouth bass and bluegills.

Everyone knows that you can feed but so many cattle on an acre of pasture, and when that number is exceeded all of the cattle will suffer from insufficient food and become poor and make poor growth. And so it is with fish, or any other type animal. The reproductive capacity of the sunfish family, which includes fliers, bass, and crappie, is astronomical. Without some natural or artificial check these fish will overpopulate an area of water to the point that none of them will grow to any usable length. Predatory fish, such as gar and bowfin,

Commission photos by Bowers

A graph showing the age and length comparisons of both the crappies and fliers

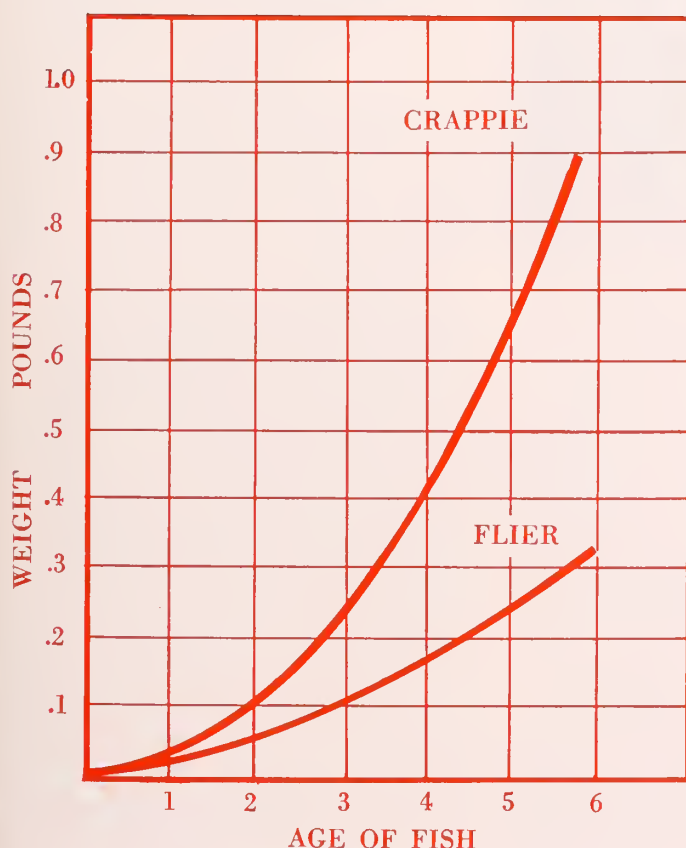


act as a natural check against the overpopulation menace by eating the smaller, stunted sunfish and allowing those that live to grow to usable size. In view of this fact it is recommended strongly that these predators be protected as far as possible. To aid further in this sunfish population reduction it is recommended that all the crappies and fliers caught by anglers from Lake Drummond be kept, regardless of the size. In addition to this reduction of the sunfish, a further study should be made that the success of the reproduction of all species and the suitability of the water for largemouth and bluegills can be observed.

It may seem strange to many fishermen to read of a body of water in which there are too many fish, but when it is considered that the lack of food limits growth in fish as it does in any other form of life, then it can be more easily understood. When there are 20 fish to eat only enough food for 10, then all of the 20 will become stunted. When there is too little food for some of our game animals they will die or fail to reproduce, but not so with fish. They just don't grow, but still they reproduce, making the situation even worse. The solution may lie in the introduction of more fish-eating fish, such as bass, pike, or bowfin, or at least in protecting what predatory fish that are in the lake. These predators will keep the small fish in check, allowing those that remain to grow to usable size. There are a lot of fish in Lake Drummond.

Commission photos by Bowers

A graph showing the age and weight comparisons of both the crappies and fliers



Hip-deep in water, the fish technicians stretch out a fyke-net from shoreline outward, in likely looking crappie water



Catfish! It didn't take long to tell that there was an overpopulation of stunted catfish and not enough predator fish in Lake Drummond

Dyed-in-the-wool bass fishermen may consider Lake Drummond of questionable value. But the fly rod fanatic who holds size and fight of a fish above tradition will discuss all night, if need be, the relative merits of an 18-inch crappie from the waters of Lake Drummond. And there are plenty 18-inch crappies still lurking in the root-tangled shoreline of this Dismal Swamp paradise.

If the enticement of oversized crappies is not enough to lure the rabid bass fisherman into the heart of the great Dismal Swamp, we can assure him of his limit of fliers, not so big, but mighty tasty. And furthermore, the value of being five miles from a road and still farther from the nearest phone is to be considered. If fishing in solitude is to your liking, you'll like fishing in Virginia's historic, scenic, and incomparable Lake Drummond, the lake with a future.



ANDREW LEWIS FFA CHAPTER WINS TOP HONORS FOR WILDLIFE CONSERVATION WORK

The Andrew Lewis Chapter of the Future Farmers of America, Roanoke County, won top honors, out of 212 Virginia chapters competing for recognition in wildlife conservation work, according to FFA Foundation personnel.

Some of the accomplishments of the winning chapter were as follows: 32 of the 41 members entered essays in the Commission-Izaak Walton League sponsored Wildlife Essay Contest; 635 hours were spent on wildlife improvements on their individual farms; cared for 25,000 bicolor lespedeza plants; sowed 25 pounds of game bird mixture; and 25 members subscribed to *Virginia Wildlife* and other wildlife conservation magazines.

Other chapters receiving recognition in the contest were Louisa, Louisa County, Riner, Montgomery County, and Spottswood, Augusta County. The prizes were \$50, \$40, \$30, and \$25, in that order.

Judges in the contest were Chester Phelps, chief of the Commission's game division, Robert Merritt, Commission special services officer, and Robert Bowers, associate editor of *Virginia Wildlife* magazine.

BATH COUNTY DEER RANGE BADLY DAMAGED

Upon his return from an inspection tour of Bath County deer range, I. T. Quinn, executive director of the Commission, reported that the range is badly damaged from the overbrowsing of too many deer.

Quinn cited two widely separated localities, Wilson Creek in the southern part of the county and Back Creek in the western part, where the range is

heavily overbrowsed. This was especially true on the Wilson Creek area, which makes up a goodly part of Bath County's deer country, where trees and shrubs are so heavily browsed that the area resembles that of a park. Wilson Creek is the area in which a great number of deer have been found dead.

COMMISSION CHAIRMAN MAKES ESSAY AWARD

In addition to the 8 grand prize winners in the Fifth Annual Wildlife Essay Contest, there were 48 other cash prize winners throughout the state.



Commission chairman, Beverley W. Stras, Jr., shown presenting Phyllis Eanes, of Tazewell High School, her check for \$25 which she won in the Fifth Annual Wildlife Essay Contest

In many instances the lesser cash prizes were awarded to the students at a general assembly by Commission wardens, but in the case of Miss Phyllis Eanes, of Tazewell High School, Commission chairman, Beverley W. Stras, Jr., was on hand to make the presentation.

NEW WILDLIFE SOCIETY OFFICERS

Results of the election of officers and representatives of the Wildlife

Society for the year 1952-53 have just been tabulated. These new officers are listed below. All Society members are requested to address their correspondence to the appropriate officials. If correspondence is addressed to past officers, it will be necessary for them to forward it to the present officers. The address of each of the following individuals is given in the current *Wildlife Society Directory*. Daniel L. Leedy, president, Paul D. Dalke, vice-president, W. C. Glazener, secretary, and E. L. Cheatum, treasurer. Representatives: Durward Allen, region I, Arnold O. Haugen, region II, Thomas R. Evans, region III, Levi Mohler, region IV, W. B. Davis, region V, Starker Leopold, region VI, and Ian M. Cowan, region VII.

WANDERING BASS TRAVELS 140 MILES FROM PLACE OF TAGGING

Fish, like humans, sometimes get the wanderlust and travel far from their native waters, Dean Rosebery, assistant chief of the Commission's fish division, reports.

Rosebery backs up his statement by citing the case of a Back Bay bass which traveled 140 miles from where it was tagged. The bass was tagged by Commission biologists March 27, 1951 in Kettle Slough at Back Bay. It was 12 inches long at the time of tagging. It was recaptured on May 21, 1952 in the Meherrin River in North Carolina, an approximate distance of 140 miles.

The course taken by the wandering bass had to be from Kettle Slough through Currituck Sound, through Albemarle Sound, up the Chowan River into Meherrin River where it was caught. At the time of capture the bass was 12 $\frac{3}{4}$ inches long and weighed 1 $\frac{3}{4}$ pounds.



COMMISSION GAME MEN STUDY MARYLAND'S MARSH IMPROVEMENTS

In an effort to find methods of improving the thousands of acres of tidal marshland in the Eastern Shore counties of Virginia for waterfowl, the Commission sent three game division personnel to study Maryland's plan of action on her Eastern Shore marshlands.

Maryland has been doing experimental work on salt water marshes to improve tidal waters for waterfowl. Inasmuch as there are thousands of acres of public owned marshes in Virginia's Eastern Shore counties, Chester Phelps, game chief, Charles Gilchrist, waterfowl biologist from Tappahannock, and Harold Little, game technician from Caret, have gone to Maryland to determine if the same methods are feasible in Virginia.

Phelps related that salt water marshes are considered particularly difficult to develop in reasonable cost limits, for each tide ebbs and flows over them. The problem is to hold small amounts of water over the marshes all the time, even if it is only one to two inches, so that waterfowl food conditions can be improved.

GAS LINE RIGHT-OF-WAYS TO WORK FOR WILDLIFE

Three miles of gas line right-of-ways in Prince George County have been planted to wildlife foods under the supervision of Commission game technician George Gehrken, in co-operation with landowners and interested sportsmen.

These right-of-ways, normally barren, eroded, and unproductive, have been planted to quail food mixture, milo maize, and bicolor plants and seed. The planting started this spring as a demonstrational project, but has taken hold with the local citizens and

more plantings will be made this fall. This area is but one of several gas and electric power line right-of-ways throughout the state being put to work for wildlife.

CREEL CENSUS ON HOLSTON SHOWS BETTER THAN ONE FISH PER HOUR

The creel census man, Bob Martin, was kept pretty busy on South Holston Reservoir on opening day, May 30. During the one-day period he censused 164 boat fishermen and found that they caught 1,000 fish per 1,000 hours fished or one fish per hour. In the



Bob Martin, fish biologist, is shown checking a catch of bass on South Holston Reservoir last May 30

same period of time he found that 33 shore fishermen averaged 2.6 fish per hour. Most of the catch was made up of carp, but 19 per cent were large-mouth bass and 16 per cent were small-mouth bass.

COMMISSION SUPPLIES PLANTS AND SEED FOR 65,000 QUAIL DURING YEAR

During the present year the Commission of Game and Inland Fisheries supplied farmers in Virginia with quail food plants and seed that, upon maturity, will furnish food enough for

65,000 quail. I. T. Quinn, executive director of the Commission, reports.

Quinn reported that the Commission, during the present year, has supplied farmers of the state with 2,000,000 bicolor lespedeza plants and 4,500 pounds of bicolor seed. These plants have been set out in strips 15 feet wide and 400 feet long, and the seed likewise has been planted in similar strips, using one pound of seed to each strip.

Each of these strips will supply food for one covey of quail, averaging 10 birds per covey, during the critical winter months. The total number of food strips planted will supply food enough for 6,500 coveys or 65,000 birds.

Since bicolor lespedeza is a perennial, these plants will remain available for the quail as a continuous food supply for years to come.

In addition to the bicolor plants and seed, the Commission has supplied sportsmen groups and farmers with 36,780 pounds of game food seed, including approximately 7,000 pounds of which came from its demonstration area at Hawfield.

These plantings should prove a boon to the bobwhite quail and other game in the Old Dominion. The bicolor matures its seed in the fall of the year and these, for the most part, remain intact during the winter months, the most critical time for wildlife.

COMMISSION SPECIAL SERVICES OFFICER REACHES 1046 PERSONS IN MAY

During the month of May the Commission's special services officer, Bob Merritt, visited with, talked and showed wildlife conservation movies to a total of 1046 persons in Virginia. All this is in conjunction with the Commission's policy of keeping the public informed as to its activities, as well as making people more conservation conscious in the Commonwealth.

Wildlife Questions and Answers

Ques.: What is the cause of tularemia, and how can one guard against it and continue to hunt rabbits?

Ans.: Tularemia is caused by infection-carrying ticks. This disease is definitely one to be guarded against, but not one to kill the rabbit hunting spirit of the sportsman. With simple precautions rabbit-fever can be avoided. Don't handle rabbits or squirrels which are sluggish. Don't hunt them until cold weather, for after that time the ticks drop off and the infected rabbits die, leaving only the healthy, disease-free stock to hunt. For absolute protection use rubber gloves when dressing a rabbit. Once the meat is cooked there is no danger.

Ques.: Is it true that the raccoon actually washes all of its food before it eats it?

Ans.: The widespread belief that the "coon" always washes its food before eating is not always true, since many of its meals are found and consumed far from any source of water where it would be impossible for it to clean it. Many captive raccoons fail to show this trait.

Ques.: Is it true that the woodchuck is a rodent, and if so wouldn't it be the largest rodent we have in Virginia?

Ans.: Yes, the woodchuck is a rodent, but it is not the largest rodent we have in Virginia. The beaver is the largest North American rodent and is found in Virginia in great numbers in some localities.

Ques.: Where can I obtain a license to hunt, fish, or trap in Virginia?

Ans.: Hunting, fishing, and trapping licenses and permits are obtainable from the offices of the clerks of the circuit courts of the counties, and the corporation courts of the cities, and from other authorized agents of the Commission of Game and Inland Fisheries, and state forest permits from Virginia Forest Service personnel. Hunting, fishing, and trapping licenses cannot be obtained from the Commission offices in Richmond.

Ques.: My hunting party came upon a skunk in the western mountains of the state last fall and it was not striped as they usually are, but was spotted with white spots. Would this be unusual or is this a common occurrence among the striped skunks?

Ans.: The skunk you saw most likely was not a striped skunk, but rather a little spotted skunk. This animal is more commonly found in the mountains and woodlands, whereas, the striped individual is more common in fields, meadows, and open or partly wooded farmlands.

Ques.: Are any of the mole furs sold in the U. S. from the common mole found in lawns and gardens or are they from some other type animal?

Ans.: In Europe the mole is widely trapped for its soft thick fur, and the common mole found in the garden and lawn in the U. S. has fur of similar quality, but almost all of our commercial mole fur is imported from Europe.

Ques.: Who has jurisdiction over the commercial fisheries of the state?

Ans.: Commercial fishing does not come under the jurisdiction of the Commission of Game and Inland Fisheries, but is controlled by another state agency known as the Commission of Fisheries, with headquarters at Newport News.

Ques.: How does a bird's diet compare to that of a human for one day?

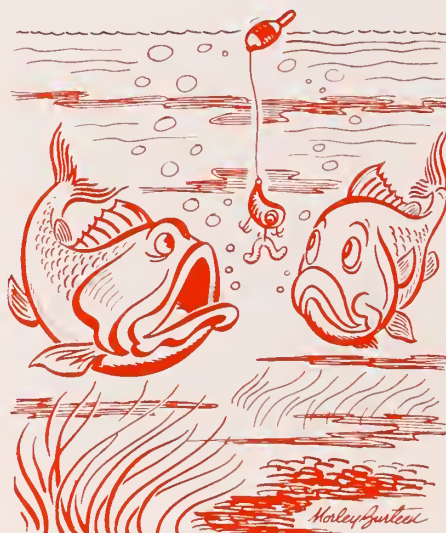
Ans.: If a human family ate in proportion to a family of birds, the daily grocery list might appear something like this: 50 loaves of bread, 25 pounds of hamburger, 30 doughnuts, 10 pounds of spinach, 6 heads of lettuce, and 1 gallon of ice cream.

Ques.: Has anyone ever estimated or found out an approximate figure on the true value of birds, not just game birds but all birds?

Ans.: According to the early United States Biological Survey, the annual value of birds in destroying insects was placed at 250 million dollars. In Virginia the annual value has been put at some 10 million dollars.

Ques.: What type license is required to hunt bullfrogs with a rifle?

Ans.: A regular hunting license is required to hunt bullfrogs in Virginia. All amphibians are classified as wild animals.



"I can't remember the bait but the line is familiar"

Ques.: Do deer (bucks) really drop their antlers? If so, why are their antlers never found in the woods?

Ans.: It is indeed true that buck deer drop their antlers, and some of these antlers are found, but not as often as might be expected. The reason that few of them are found is that during the time the antlers are dropped (usually January to March) the hunting season is over and there are very few people in the woods at that time. By the time people again start enjoying the woodlands, the antlers have been gnawed completely away by rodents, including rabbits, mice, and many others. If the antlers are not completely gone, they usually are gnawed beyond recognition for the casual observer.

Ques.: Is a license required to fish in the tidal waters of the James and the Appomattox Rivers at the wharf in Hopewell, Virginia?

Ans.: Yes. The law provides that wherever game fish are found in waters of the state, a license is required. Game fish are designated as the brook and rainbow and brown trout, all of the sunfish family, including the largemouth and smallmouth bass, bream, pike perch, rock bass, spotted bass, crappie, white bass, and walleye.

Ques.: How many species of birds are found in the state of Virginia?

Ans.: 401 species.

Ques.: What kind of fish is the one usually referred to as the pike, and is it caught in New River?

Ans.: The pike caught in New River is not actually a pike at all, but rather it is a member of the perch family. It is the wall-eye, although because of its teeth and long slender appearance, it is referred to as the walleyed pike.

Ques.: What is the warmouth?

Ans.: The warmouth is a sunfish, appearing chiefly in coastal plains lakes and streams. Although commonly called redeye, or rock bass in these waters, it is not to be confused with the rock bass of the upland streams. Different laws apply to the warmouth and the rock bass. Warmouth daily limits are 25, including all other sunfish and crappie. With the rock bass, the daily limit is 15. There is no closed season on the warmouth. The rock bass season conforms with that of the bass season.

Ques.: Do my two 14-year-old boys need a license to fish here in Virginia?

Ans.: No. Fishing licenses are not required of resident persons under sixteen years of age.

Ques.: Are there any fresh water game fish that can be legally sold in Virginia?

Ans.: No. It is unlawful to sell fresh-water bass, fresh-water trout and any other game fish taken in the fresh waters of the state of Virginia.

Ques.: In what counties of the state is Sunday fishing prohibited?

Ans.: Sunday fishing is prohibited in counties of Alleghany, Bath, Bland, Botetourt (except James River and Carvin's Cove), Craig, Giles (except Mountain Lake and New River), Highland, Rockbridge, Surry (except Sunken Meadow Lake in Surry County), and in Silver Lake in Rockingham County.

CORRECTION

The last answer on page 26 of the July issue of *Virginia Wildlife* should have read:

"... if you desire to fish only in the South Holston Reservoir, an interstate impoundment between Virginia and Tennessee, you may obtain a special non-resident three-day fishing license for that body of water only at a cost of one-dollar."



Don't light a cigarette before pouring gasoline; fumes are highly explosive



Don't start the motor before checking if your partner is ready. This could lead to a split head, at least

FIVE DON'TS ON A FISHING TRIP

Commission photos by Kesteloo

Depicted on this page are five lessons on how not to have an accident on a fishing trip. These scenes are common on every body of water where boating is enjoyed. Accidents do not have to happen, but with carelessness comes trouble and all the joy that goes with fishing and boating is overshadowed by sorrow.



Don't see how badly you can swamp the neighboring boats. This won't make friends, and may lead to drowning



Don't keep your partner in suspense; cast away from his head. Look where you're casting. Eyes are hard to replace



Don't race each other to your new positions when changing places in a boat. One of you may never reach the other position

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